



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,309	02/27/2004	Masataka Mochizuki	249466US0DIV	4332
22850	7590	05/05/2006	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			VORTMAN, ANATOLY	
			ART UNIT	PAPER NUMBER
			2835	

DATE MAILED: 05/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/787,309

Applicant(s)

MOCHIZUKI ET AL.

Examiner

Anatoly Vortman

Art Unit

2835

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26,27 and 32-49 is/are pending in the application.
- 4a) Of the above claim(s) 32,33,41-43 and 49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26,27,34-40 and 44-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Amendment

1. The Applicant's amendment filed on February 27, 2006 had been received. At this point claims 1-25 and 28-31 have been cancelled, claim 26 has been amended, claims 32 and 33 have been withdrawn from further consideration, and new claims 39-49 have been added. Thus, claims 26, 27, and 32-49 are pending in the instant application.

Election/Restrictions

2. Newly submitted claims 41-43 and 49 are directed to an invention that is independent or distinct from the invention as originally elected, (i.e. Specie 2, Fig. 4).

Claims 41-43 and 49 are in agreement as to not being elected, because they read on Fig. 1-3, 5, and 6, depicting non-elected species. Claims recite "a grading layer", "a graphite layer", and "a lubricating material", the features characteristic of the non-elected species. The elected Specie II has none of the aforementioned features and Fig. 4 does not depict these features as well.

The Applicant has received an action on the merits for claims drawn to Specie II, because this invention has been elected for prosecution on the merits. Accordingly, claims 41-43 and 49 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03. Accordingly, action on claims 26, 27 and 34-40, and 44-48, which fall within elected Specie II, is follows.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 26, 27, 34, 39, 40, and 44, are rejected under 35 U.S.C. 103(a) as being unpatentable over US/6,317,322 to Ueki et al., (Ueki) (of record) in view of US/4,029,628 to Fredberg.

Regarding claims 26 and 39, Ueki disclosed (Fig. 9) an electronic device comprising: an electronic part or die (52) joined to a heat spreader (50) joined to a heat sink (51), wherein said heat spreader (50) comprises a sealed structure (501) encapsulating a condensable fluid therein which can repeatedly evaporate and condense to transport heat; wherein said electronic device comprises means for joining the die or electronic part (52) to the heat spreader (50) (i.e. thermal grease (column 2, line 58)) so that thermal stress that causes separation of the die or electronic part (52) and the heat spreader (50) does not occur (inherently, since the Ueki device is designed to withstand the stresses and not to fall apart), but did not explicitly disclose means for bonding or integrally joining (e.g., synthetic resin adhesive).

Fredberg disclosed a synthetic resin adhesive composition for bonding and integrally joining integrated circuits to a heat sink and conducting heat therebetween (see abstract and column 1, line 40+), wherein said composition has improved thermal conductivity and is inert to chemicals used for manufacturing of printed circuit boards (column 1, lines 49-63).

It would have been obvious to a person of ordinary skill in the cooling art at the time the invention was made to substitute grease of Ueki with composition of Fredberg in order to provide secure thermal path between the electronic device and the heat sink, while improving rigidity of the structure. The aforementioned modification will also improve the ability of thermal interconnection to withstand chemicals used for manufacturing of printed circuit boards (Fredberg, column 1, lines 49-63)

Regarding claim 27 and 40, Ueki disclosed that the die or electronic part (52) and heat spreader components (50) are selected to have about the same coefficients of thermal expansion such that they do not generate thermal stress sufficient to separate the die or electronic part (52) and the heat spreader (50) (inherently, since the Ueki device is designed to withstand the stresses and not to fall apart).

Regarding claims 34 and 44, Ueki disclosed that said electronic part (52) is a semiconductor chip (see column 2, lines 26-31), thus it inherently comprises silicon.

5. Claims 35-38 and 45-48, are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueki taken alone.

Regarding claims 35, 36, 45, and 46, the common knowledge or well-known in the art statement (i.e., that aluminum nitride and invar having said ingredients have been notoriously known in cooling art at the time the invention was made as good materials for making heat conductive components of cooling systems) is taken to be admitted prior art because applicant failed to traverse the examiner's assertion of official notice made in previous non-final Office action of December 1, 2005.

Art Unit: 2835

Regarding claims 35, 36, 45, and 46, Ueki disclosed all, but that the heat spreader is made of the aluminum nitride or invar having specific ingredients (i.e. Mn, C, Ni, and Fe) and specific ratios of said ingredients (.4%, .2%, 36%, and 63.4%, respectively). The Official Notice is taken of the fact that aluminum nitride and invar having said ingredients have been notoriously known in cooling art at the time the invention was made as good materials for making heat conductive components of cooling systems and said ingredients were commonly used for making the invar at the time of the invention, thus it would have been obvious to a person of ordinary skill in the cooling art at the time the invention was made to select aluminum nitride or invar having aforementioned claimed ingredients for making the heat spreader of Ueki in order to achieve desired coefficient of thermal expansion of said heat spreader and desired rate of heat dissipation, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding the specific claimed ratios of the invar ingredients, these ratios are the result effective variables, wherein the result is a coefficient of thermal expansion of the heat spreader.

It would have been obvious to one having ordinary skill in the cooling art at the time the invention was made to select any appropriate ratios of said ingredients, including as claimed, in order to achieve the desirable coefficient of thermal expansion of the heat spreader, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 37, 38, 47, and 48, claims recite the way the electronic device is employed, i.e. that said electronic device is an MPU or an image processor. The Examiner would

Art Unit: 2835

like to direct the Applicant's attention to the fact that the way said electronic device is employed does not affect the structure of the device and does not impart patentability of the device. The cooling arrangement would still be the same, whether said device is an MPU, image processor, CPU, or any other heat producing component. What is important is only the fact that said component is producing the heat, which needs to be dissipated. Therefore, the subject matter recited in the aforementioned claims had not been given patentable weight.

It would have been obvious to a person of ordinary skill in the electronic and cooling fields of endeavor to use the disclosed cooling arrangement of Ueki in conjunction with any electronic device in order to dissipate heat produced by said device and in order to satisfy the requirements of a particular specific application, since it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

Response to Arguments

6. Regarding the coefficient of thermal expansion, as presented in the rejection above, the electronic part (die) (52) and the heat spreader are inherently have about (as claimed) the same coefficients of the thermal expansion. The Applicant's argument that the keyword search of the Ueki disclosure did not produce any words "coefficients" and "separation" is not persuasive. The express, implicit, and inherent disclosures of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. 102 or 103. "The inherent teaching of a prior art reference, a

question of fact, arises both in the context of anticipation and obviousness." *In re Napier*, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995).

The remaining arguments are moot in view of the new grounds of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anatoly Vortman whose telephone number is 571-272-2047. The examiner can normally be reached on Monday-Friday, between 10:00 am and 6:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Lynn Feild can be reached on 571-272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'A. Vortman', with a long horizontal line extending to the right.

Anatoly Vortman
Primary Examiner
Art Unit 2835